





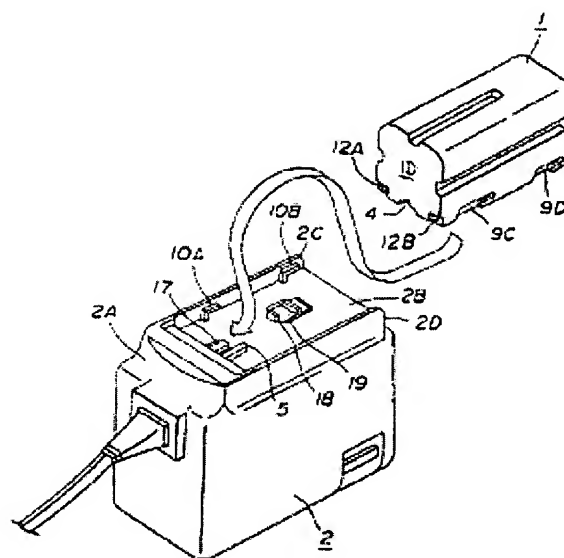
Battery device and loading device for battery device**Patent number:** EP0707350**Publication date:** 1996-04-17**Inventor:** MITSUI HIDERO (JP); AOKI HISASHI (JP); NODA YASUSHI (JP)**Applicant:** SONY CORP (JP)**Classification:**

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Application number: EP19950401991 19950901**Priority number(s):** JP19940210211 19940902**Also published as:** US5672441 (A1) JP8077991 (A) EP0707350 (B1)**Cited documents:** EP0559573 EP0572327**Abstract of EP0707350**

A battery device (1) that prevents mistaken connection to a main apparatus (2) includes a casing (1A) housing a battery. The casing has a loading surface section (1C) on a lateral surface on its outer periphery. The loading surface section is adapted for mounting to a setting surface section (2B) of a main apparatus (2). The loading surface section (1C) of the casing has a discrimination groove (4) having an opening end opened in an abutment surface (1D) and extending from the opening end parallel to the loading direction of the device (1) on the main apparatus (2). The abutment surface (1D) is formed on the loading surface of the casing for extending in a direction at right angles to the loading surface section (1C).

**FIG.5**

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(54) **Battery device and loading device for battery device**

Batterieanordnung und Ladevorrichtung

Batterie et dispositif de chargement de celle-ci

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EP-A- 0 559 573 **EP-A- 0 572 327**

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EP 0 707 350 B1

Description

FIELD OF THE INVENTION

[0001] This invention relates to a battery device having enclosed therein a rechargeable cell or a dry cell, and a loading device upon which the battery device is seated, such as a portable electronic apparatus which employs the battery device as a power source.

BACKGROUND OF THE INVENTION

[0002] A portable electronic apparatus, such as a portable video tape recorder, a tape player, a video camera or a disc player, is generally designed so that a dc power source, such as a rechargeable cell or a dry cell, may be used as a power source in addition to a commercial power source supplied via a dc conversion adapter.

[0003] Consequently, in these electronic apparatus, a battery loading unit is built into a portion of a casing of the apparatus, and a battery device, having enclosed therein a rechargeable cell or a dry cell, is connected to the battery loading unit. When the charge of the cell in the battery device has become depleted, the battery device is loaded on a battery loading unit provided on a charger having a dc conversion adapter.

[0004] A conventional battery device 51 is explained with reference to Figs. 13 and 15. The battery device 51 is roughly made up of a casing 51A having a battery housing unit therein, a rechargeable cell (not shown), housed within the battery housing unit, and a pair of terminals 48A, 48B connected to the rechargeable cell.

[0005] The casing 51A has a substantially rectangular loading surface section 51B, and two substantially columnar-shaped chargeable cells that are housed within the battery housing unit. In the loading surface section 51B is formed a mounting recess 40 in parallel with the loading direction so as to be opened at its one end on an abutment surface extending at right angles to the loading surface section.

[0006] In the mounting recess 40 is movably mounted a charging discriminating member 41 which indicates the charging state. The charging discriminating member 41 is moved along the mounting recess 40 for indicating, depending on the position to which the discriminating member has been moved, whether the rechargeable cell housed within the housing unit is charged or yet to be charged.

[0007] The loading surface section 51B has a substantially rectangular-shaped recess 43 at a position coincident with the centerline of the mounting recess 40. At a midposition of the surface section, substantially coincident with the recess 43, is formed a substantially rectangular loading guide recess 44. In addition, a substantially rectangular loading and holding recess 45 is disposed in such a way that its centerline is coincident with the loading guide recess 44.

[0008] The casing 51A has substantially L-shaped first and second guide grooves 46A, 46B in series with each other along a lateral surface thereof parallel to the loading direction. The casing 51A also has a third guide groove 46C and a fourth guide groove 46D in a lateral surface thereof opposite to the lateral surface carrying the first and second guide grooves so that the third and fourth guide grooves face the first and second guide grooves, respectively as shown in Fig. 15.

[0009] Referring to Fig. 14, a main apparatus 52 on which the above-described battery device is loaded is now explained. The main apparatus 52 includes a casing 52A having a setting surface section 52B for loading the battery device 51 thereon, and connection terminals 49A, 49B for connection to terminals 48A, 48B of the battery device 51.

[0010] The casing 52A has a substantially rectangular operating boss 58 having its one end integrally connected to an abutment surface 52E extending at right angles to the setting surface section 52B. The setting surface section 52B has a substantially rectangular opening 53 at a position coincident with the centerline of the operating boss 58, and a substantially rectangular engagement portion 54 integrally formed to extend from a lateral surface of the opening 53. The engagement portion 54 is resiliently flexible about its proximal point and has an engagement boss 54A at its distal end.

[0011] In the setting surface section 52B is integrally formed a loading guide section 55 in the form of a substantially elliptical pillar. The setting surface section 52B has a substantially rectangular opening 56 at a position coincident with the centerline of the loading guide section 55 and a substantially rectangular loading holding section 57 is integrally protruded from a lateral side of the opening 56. The loading holding section 57 is resiliently flexible about the proximal point, and has a loading holding protrusion 57A integrally formed at its distal end.

[0012] The casing 52A has a pair of guide wall sections 52C, 52D on its both lateral sides parallel to the setting surface section 52B so that the guide wall sections are at right angles to the setting surface section 52B and parallel to the loading direction. On the inner wall section of each of the guide wall section 52C are formed substantially L-shaped first and second guide protrusions 47A and 47B.

[0013] On the inner wall section of the guide wall section of the casing 52A opposite to the guide wall section 52C having the first and second guide protrusions 47A and 47B are integrally formed a third guide wall protrusion 47C and a fourth guide protrusion 47D facing the first guide protrusion 47A and the second guide protrusion 47B, respectively.

[0014] On both lateral end portions of the abutment surface 52E extending at right angles to the setting surface section 52B are formed first and second connection terminals 49A and 49B, respectively. These first and second connectable terminals 49A and 49B are connected to a dc conversion unit (not shown).

[0015] The first and second connection terminals 49A and 49B are protected by a protection member 50 having a substantially U-shaped cross-section. The protection member 50 is mounted for movement in the loading direction. The protection member 50 has a resilient member (not shown) resiliently flexed so as to be moved towards the abutment surface 52E for enabling the first connection terminal 49A and the second connection terminal 49B to protrude out from the protection member 50.

[0016] The operation of loading the battery device 51 on the main apparatus 52 and the operation of the charging discriminating member 41 provided on the battery device 51 are now explained. First, the first to fourth guide protrusions 47A to 47D formed on the inner wall surfaces of the guide wall sections 52C, 52D of the setting surface section 52B of the main apparatus are caused to bear against the first to fourth guide grooves 46A to 46D formed in the battery device 51.

[0017] As the battery device 51 is moved along the loading direction, the first to fourth guide protrusions 47A to 47D protuberantly formed on the guide wall sections 52C, 52D of the main apparatus 52 are moved along the first to fourth guide grooves 46A to 46D formed in the battery device 51 until being abutted against the ends of the first to fourth guide grooves 46A to 46D. The battery device 51 is retained in this manner by the main apparatus 52.

[0018] When the battery device 51 is moved along the loading direction, the loading guide section 55 formed on the setting surface section 52B of the main apparatus 52 is introduced into the loading guide recess 44 formed in the loading surface section 51B. The loading guide section 55 is moved along the loading guide recess 44. The battery device 51 is retained by the main apparatus 52 by the loading guide section 55 being abutted against one end of the loading guide recess 44.

[0019] As the battery device 51 is further moved along the loading direction, the loading holding section 57 protuberantly formed on the loading surface section 52A of the main apparatus 52 is resiliently flexed in the loading holding guide recess 45 formed in the loading surface section 51A. The battery device 51 is retained in this manner by the loading and holding protrusion 57A being engaged in the loading and holding recess 45.

[0020] When the battery device 51 is further moved along the loading direction of the main apparatus 52, the actuating protrusion 58 protuberantly formed on the setting surface section 52B of main apparatus 52 is caused to bear against the end of the charging discriminating member 41 movably mounted in the mounting recess 40 of the loading surface section 51B. Consequently, when the battery device 51 is moved in this manner along the loading direction, the charging discriminating member 41 is thrust by the actuating protrusion 58. As the battery device 51 loaded on the main apparatus 52 is pulled out in a direction opposite to the loading direction, the loading holding section 57 is resiliently deflect-

ed by one end of the loading holding recess 45 for disengaging the loading and holding protrusion 57A from the loading and holding recess 45.

[0021] As the battery device 51 provided on the main apparatus 52 is pulled out in a direction opposite to the loading direction, the engagement protrusion 58 formed integrally on the setting surface section 52B of the main apparatus is engaged in a cut-out groove 41A formed in the charging discriminating member 41 movably mounted in the mounting recess 40 of the loading surface section 51A. Consequently, as the battery device 51 is moved in the direction opposite to the loading direction, the charging discrimination member 41 is pulled out by the engagement protrusion 58.

[0022] The battery device 51 is occasionally designed as a high capacity battery device having two stages of the battery devices in order to permit the electronic apparatus to be employed for a longer time interval. With such battery device, two rechargeable cells are housed in a side-by-side relation to each other.

[0023] Heretofore, the usual battery device and the high capacity battery device are designed to have a common structure as to, for example, the shape of the loading surface section for the electronic apparatus, so that the usual battery device or the high capacity battery device may be interchangeably loaded on the electronic apparatus.

[0024] However, certain electronic apparatus cannot be used except with the high capacity battery device. The electronic apparatus having the high capacity battery device connected thereto can be used for a longer time. In addition, some of the electronic apparatus need to be used for prolonged time in order to be used conveniently. For example, some of the portable video cameras are designed so that the usual battery device cannot be connected thereto, in order to assure continuous photographing.

[0025] That is, if the usual battery device is provided on the portable video camera for prolonged photographing, the video camera operation may cease thereby interrupting photographing, necessitating the burdensome requirement that the consumed battery device be charged and exchanged frequently. Consequently, with some of the electronic apparatus, it is necessary to discriminate the usual battery device and the high capacity battery device from each other to permit the battery device suitable to the operating conditions of the electronic apparatus to be powered with the battery device.

[0026] Referring to Figs. 13 and 14, the loading device for discriminating the usual battery device from the high capacity battery device is now explained. The usual battery device 51 in the present battery loading device has a discrimination recess 53 on its lateral surface parallel to the loading direction of the loading surface section, as shown in Fig. 13. On the other hand, the main apparatus 52 has an operating member 54 on an inner wall surface of the guide wall section 52C, as shown in Fig. 14.

[0027] The present loading device utilizes a push-pull switch, that is, a switch which is turned on when the operating member 54 is moved by a force and which is turned off when the force is removed. Such a push-pull switch is provided on the inner wall of one of the guide wall sections 52C of the main apparatus 52.

[0028] With such a battery loading device, when the battery device 51 is inserted on the setting surface section 52B, the operating member 54 provided on the main apparatus 52 is moved by the lateral surface of the battery device 51. When moved to a position of the discriminating recess 53 formed in the battery device 51, the operating member 54 is protruded so as to produce a detection sound or turn on a detection light for apprising the user that the battery device 51 has been detected.

[0029] With the above-described slot-in type loading device for the battery device, in which a bottomed box-shaped loading section is provided in the main apparatus and the battery device is inserted via an aperture formed on one lateral side of the loading device until it is housed therein in its entirety, the operating member 54 is repeatedly changed on and off in the course of loading of the battery device. Thus, the loading device for the battery device has a defect in that the circuit of the operating member 54 may be adversely affected by such repeated and frequent changeover operations of the operating member 54. This may result in an increased likelihood of a failure in detection.

[0030] On the other hand, the loading device for the battery device detects the type of the battery device 51 loaded on the main apparatus 52 in a simple manner. It is not designed so that the main apparatus may prevent the loading of the battery device 51. That is, the type of battery device is determined after the battery device 51 has been fully loaded on the main apparatus 52. However, since the electronic apparatus needs to be protected against destruction, it is desirable to initially determine the type of battery device 51 when it is attempted to connect the battery device 51 with the main apparatus 52.

[0031] In addition, with the above-described loading device, the space for mounting the operating member 54 to detect the battery device 51 must be on the guide wall section 52C of the main apparatus 52. However, this loading device is not desirable for a portable electronic apparatus which requires a reduced size and thickness.

[0032] Document EP-A-0 559 573 discloses a battery device comprising a guide groove and an inverted insertion inhibiting groove which are provided along the centerline of respective outer surfaces of the battery device.

[0033] It is therefore an object of the present invention to provide a battery device with which it is possible to clearly and reliably determine the type of battery device in order to inhibit the mistaken loading of an incorrect battery type on the main apparatus, thereby preventing damage to the main apparatus. It is another object of

the present invention to provide a loading device for a battery device which similarly provides a clear and reliable determination of a battery type in order to inhibit the mistaken loading of an incorrect battery on the main apparatus in order to prevent damage to the main apparatus.

SUMMARY OF THE INVENTION

[0034] For accomplishing the above objects, the battery device according to the present invention comprises: a casing having a battery housing unit disposed therein and having a loading surface section on a lateral outer surface thereof, said loading surface section being adapted for connection to a setting surface section of a main apparatus, and said battery housing unit in said housing being adapted for receiving at least one battery, wherein said loading surface section of the casing has a discrimination groove having an opening end opened in an abutment surface and extending from said opening end in a direction parallel to the loading direction of the battery device on the main apparatus, said abutment surface being formed on the loading surface of the casing in a direction at right angles to the loading surface section, and wherein at least a pair of guide recesses are formed in lateral surface sections of the casing extending at right angles to the loading surface section, parallel to the loading direction, at an outer periphery of the casing, said discrimination groove being located at a position offset relative to the centerline of the loading surface section and the front end of the guide recesses, with respect to the loading direction of the battery device on the main apparatus, being closer to said abutment surface than the rear end of the discrimination groove.

[0035] The battery housing unit may be formed by a spacing delimited by a continuous inner wall section having an arcuate cross-section for holding plural batteries each of a substantially columnar cross-section in a side-by-side relation. The discrimination groove is preferably formed in the loading surface section in registration with a thickened portion of the inner wall section.

[0036] The casing preferably has terminals at the ends of the lateral surface provided with the opening end of the discrimination groove. The terminals are for connection to the battery housed within the battery housing unit.

[0037] The mounting recesses may be disposed parallel to each other. A charging discrimination member may be movably mounted facing the mounting recesses for indicating that the battery is in a non-charged state or in a charged state.

[0038] For accomplishing the above-mentioned objects, a loading device for a battery device according to the present invention comprises: a casing having a battery housing unit therein and having a loading surface section on an outer surface thereof, said loading surface section being connectable to a setting surface section

of a main apparatus, and said battery housing unit being adapted for housing at least one battery, wherein said loading surface section of the casing has a discrimination groove having an opening end opened in an abutment surface and extending from said opening end parallel to the loading direction of the battery device on the main apparatus, said abutment surface being formed on the loading surface of the casing in a direction at right angles to the loading surface section, and a main apparatus having a casing having in turn a setting surface section on a lateral outer surface thereof for loading the battery device thereon, said casing also having a rib-shaped discrimination protrusion secured at one end thereof to an abutment surface formed on the setting surface section at right angles thereto, said discrimination protrusion being formed integrally with the setting surface section, said discrimination protrusion on the main apparatus being detachably engagable in said discrimination groove in the battery device, wherein the battery device has at least a pair of guide recesses on its lateral surfaces extending at right angles to the loading surface section extending parallel to the loading direction, the discrimination groove being offset with respect to the centerline of the loading surface section, and the front end of the guide recesses, with respect to the loading direction of the battery device on the main apparatus, being closer to the abutment surface than the rear end of the discrimination groove, wherein the main apparatus has at least one guide wall section on each lateral side of the setting surface section for extending at right angles to the setting surface section, guide protrusions being formed on the inner wall section of the guide wall sections, the discrimination protrusion being integrally formed at an offset position with respect to the centerline of the setting surface section, with the front end of the guide protrusions, with respect to the loading direction of the battery device on the main apparatus, being closer to the abutment surface than the rear end of the discrimination protrusion, and wherein in the initial loading state in which the guide protrusions provided on the main apparatus are inserted into the guide recesses formed in the battery device, the discrimination protrusion is inserted into the discrimination groove during loading the battery device in the main apparatus.

[0039] In the preferred embodiment of loading device according to the invention, the battery device has a discrimination groove and a mounting recess parallel to each other, and a charging discrimination member movably mounted facing the mounting recess for indicating whether the battery is in the charged state or in the non-charged state. The main apparatus has an actuating portion at the proximal end of the discrimination protrusion for inwardly thrusting the charging discrimination member provided on the battery device. The charging discrimination member has a cut-out groove facing the setting surface section of the main apparatus. The main apparatus includes an engagement protrusion engaged

in the cut-out groove formed in the charging discrimination member in alignment with the actuating portion.

[0040] With the above-described battery device according to the preferred embodiment of the present invention, since the discrimination groove is formed at a position offset with respect to the centerline of the loading surface section, and the beginning end of the guide groove is located closer to the abutment surface than the terminal end of the discrimination groove, it becomes possible for the main apparatus to detect the discrimination groove at the initial loading position when the guide recess of the battery device is abutted against the main apparatus.

[0041] With the loading device for the battery device according to the preferred embodiment of the present invention, since the discrimination groove is offset with respect to the centerline of the loading surface section of the battery device, and the beginning end of the guide groove is closer to the abutment surface than the terminal end of the discrimination groove, while the discrimination protrusion is offset with respect to the centerline of the setting surface section of the main apparatus, and the beginning end of the guide protrusion is closer to the abutment surface than the terminal end of the discrimination protrusion, the discrimination protrusion is inserted into the discrimination groove in the initial loading state in which the guide protrusion formed on the main apparatus is abutted against the guide groove formed in the battery device.

[0042] Consequently, with the present loading device for the battery device, if an inappropriate battery device is loaded on the main apparatus, the battery becomes tilted by the discrimination protrusion of the main apparatus being caused to bear against the setting surface section of the battery device before completion of loading of the battery device. Thus, it is possible with the loading device to reject attempted loading of an inappropriate battery device on the main apparatus.

40 BRIEF DESCRIPTION OF THE DRAWINGS

[0043] Fig. 1 is a plan view from underneath showing the loading surface section of a battery device according to an embodiment of the present invention.

[0044] Fig. 2 is a front view showing the battery device shown in Fig. 1.

[0045] Fig. 3 is a side view showing the battery device shown in Fig. 1.

[0046] Fig. 4 is an enlarged perspective view showing important portions of a loading surface section of the battery device shown in Fig. 1.

[0047] Fig. 5 is a perspective view illustrating the loading of a battery device according to the present invention onto a main apparatus.

[0048] Fig. 6 is a plan view showing an example of main apparatus constituting the loading device for the battery device of Figs. 1 to 4.

[0049] Fig. 7 is a longitudinal cross-sectional view tak-

en along line A-A of Fig. 6.

[0050] Fig. 8 is a partial longitudinal cross-sectional view showing the state in which the battery device is loaded on the main apparatus of Fig. 6 constituting the loading device for the battery device.

[0051] Fig. 9 is a schematic plan view from underneath illustrating loading using the battery device and the main apparatus constituting an embodiment of the loading device according to the invention for the battery device.

[0052] Fig. 10 is a schematic front view illustrating loading using the loading device for the battery device of Fig. 9.

[0053] Fig. 11 is a schematic front view illustrating loading of a conventional battery device on main apparatus constituting the loading device for the battery device according to the invention.

[0054] Fig. 12 is a schematic front view illustrating loading of the conventional battery device on the main apparatus constituting the loading device for the battery device according to the invention.

[0055] Fig. 13 is a plan view from underneath showing a conventional battery device.

[0056] Fig. 14 is a plan view from above showing a main apparatus for loading a conventional battery device.

[0057] Fig. 15 is a perspective view of a conventional battery device.

[0058] Fig. 16 is a perspective view of a battery device and a recess of an electronic apparatus in accordance with the invention.

[0059] Fig. 17 is a top perspective view of an electronic apparatus in accordance with the invention.

[0060] Fig. 18 is a plan view of a recess of an electronic apparatus, and a battery device according to the invention and a conventional battery device.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0061] Referring to Figs. 1 to 12, and 16 to 18, preferred embodiments of the present invention will be explained in detail. The battery device 1 is basically the same in construction as the conventional battery device 51, and is comprised of a casing 1A having a battery housing unit 1B, a plurality of rechargeable cells 11 housed within the battery housing unit 1B and terminals 12A, 12B connected to the rechargeable cells 11.

[0062] The casing 1A has a substantially rectangular loading surface 1C at the peripheral bottom surface defining a substantially square-shaped battery housing unit 1B, as shown in Fig. 3. The battery housing unit 1B is delimited by an inner wall section having an arcuate cross-section for defining a space within which to hold substantially columnar-shaped rechargeable cells side-by-side. Within the battery housing unit 1B, two rows each comprised of two substantially columnar-shaped rechargeable cells are arranged side-by-side in two

tiers.

[0063] On the loading surface section 1C is formed a discriminating recess 4 having an opening end opened in an abutment surface 1D extending at right angles to the loading surface section 1C in registration with a thickened portion of the inner wall section of the battery housing unit 1B, as shown in Fig. 2.

[0064] A mounting recess 6 is formed in the loading surface section 1C in parallel with the discriminating recess 4, as shown in Fig. 4. In this mounting recess 6 is movably mounted a charging discriminating member 7. The charging discriminating member 7 is formed with a cut-out groove 7A opened in the loading surface section 1C. The cut-out recess 7A is engaged in use by an engagement member, not shown, provided on the main apparatus, so as to permit the battery device 1 to be dismounted and pulled out of the main apparatus.

[0065] In the loading surface section 1C is formed a substantially square-shaped groove 14 connecting to one end of the discrimination groove 4. In the loading surface section 1C is formed a substantially rectangular-shaped loading guide recess 15 at a midportion of the loading surface section 1C in registration with the centerline of the groove 14. In the loading surface section 1C is also formed a substantially rectangular loading and holding recess 16 at a position substantially coincident with the centerline of the guide recess 15.

[0066] In a lateral side of the casing 1A extending at right angles to the loading surface 1C parallel to the loading direction are formed substantially L-shaped first and second guide recesses 9A and 9B in series with each other so as to be opened at one ends at the loading surface section 1C. In the opposite lateral side of the casing 1A are formed a third guide recess 9C and a fourth guide recess 9D in series with each other, as shown in Figs. 1 and 3, in registration with the first and second guide recesses 9A and 9B, respectively.

[0067] The discrimination groove 4 formed in the loading surface section 1C is offset with respect to the centerline of the loading surface section 1C, and is longitudinally dimensioned so as to have a portion extending parallel to the first guide recess 9A and the second guide recess 9C. In other words, the beginning ends of the first and third guide recesses 9A and 9C are positioned closer to the abutment surface 1D extending normal to the loading surface 1C than the terminal end of the discrimination groove 4.

[0068] With the above-described battery device 1 of the embodiment illustrated, since the discrimination groove 4 is offset to one side of the centerline of the loading surface section 1C, and the beginning ends of the first and third guide recesses 9A and 9C are positioned closer to the abutment surface 1D normal to the loading surface 1C than the terminal end of the discrimination groove 4, the discrimination groove 4 can be positively discriminated by the main apparatus at the initial loading stage in which the first to fourth guide grooves 9A to 9D of the battery device 1 are caused to bear

against the main apparatus. Thus it becomes possible to positively prohibit mistaken loading of the battery device 1 on the main apparatus as well as to prohibit destruction of the main apparatus.

[0069] Referring to Figs. 5 to 12, 15 and 16, an illustrative embodiment of the loading device for the battery device according to the present invention is explained. The loading device 3 (See Fig. 9) for the battery device is constituted by the battery device 1 and the main apparatus 2 on which the battery device 1 is loaded. The battery device 1 is similar to that described above in reference to Figs. 1 to 4.

[0070] The main apparatus 2 has a casing 2A having a setting surface section 2B on which the battery device 1 is loaded, and a main body of the apparatus has connection terminals 13A, 13B which are respectively abutted against and connected to the terminals 12A, 12B of the battery device 1 during use.

[0071] The casing 2A is formed with a substantially L-shaped discrimination protrusion 5 having its one end secured to an abutment surface 2E extending at right angles to the setting surface section 2B, as shown in Figs. 6 and 7. The discrimination protrusion 5 has its proximal end formed integrally with an actuating portion 8.

[0072] The setting surface section 2B has a substantially rectangular opening 20 from one lateral end of which is integrally protruded a substantially rectangular engagement portion 17. The engagement portion 17 is designed to be resiliently flexed about its proximal portion and has its distal end formed integrally with an engagement lug 17A.

[0073] On the setting surface section 2B is protruded a loading guide 18 in the form of a pillar of an elliptical cross-section on a line of extension of the engagement portion 17. In the setting surface section 2B is formed a substantially rectangular opening 21 having its centerline coincident with the loading guide 18. From a lateral side of the opening 21 is integrally protruded a substantially rectangular loading holding portion 19. The loading holding portion 19 is designed to be resiliently flexed about its proximal end as a fulcrum point and has its distal end formed integrally with a loading and holding lug 19A.

[0074] The casing 2A is integrally formed with a pair of guide wall sections 2C, 2D extending at right angles to the setting surface section 2B and parallel to the loading direction. On the inner wall surface of the guide wall section 2C are formed L-shaped first and second guide protrusions 10A and 10B in series with each other.

[0075] On the inner wall surface of the opposite guide wall section 2D to the inner wall section 2C carrying the first and second guide protrusions 10A, 10B are integrally formed a third guide protrusion 10C and a fourth guide protrusion 10D facing the first and second guide protrusions 10A and 10B, respectively.

[0076] The setting surface section 2B has a discrimination protrusion 5 which is offset with respect to the

centerline of the setting surface section 2B, and is longitudinally dimensioned so as to have a portion extending parallel to the first guide protrusion 10A and the second guide protrusion 10C. In other words, the beginning ends of the first and third guide protrusions 10A and 10C are positioned closer to the abutment surface 2E than the terminal end of the discrimination protrusion 5.

[0077] At the ends of the abutment surface 2E of the casing 2A are formed, respectively, a first connection terminal 13A as a positive electrode and a second connection terminal 13B as a negative electrode. The first connection terminal 13A and the second connection terminal 13B are connected to a dc conversion unit, not shown.

[0078] The first and second connection terminals 13A and 13B are protected by a protection member 22 having a substantially U-shaped cross-section. The protection member 22 is mounted for movement along the loading direction and is moved towards the abutment surface 2E by elastic deformation of an elastic member, not shown, for enabling the first connection terminal 13A and the second connection terminal 13B to protrude out of the protection member 22.

[0079] The operation of loading of the battery device 1 by the loading device 3 for the battery device, and of movement of the charging discrimination member 7 provided in the battery device 1, will now be explained. The first to fourth guide protrusions 10A to 10D formed on the inner wall sections of the guide wall sections 2C and 2D of the main apparatus 2 are caused to bear against the first to fourth guide recesses 9A to 9D formed on the lateral sides of the battery device 1 extending parallel to the loading direction, as shown in Fig. 8.

[0080] As the battery device 1 is moved along the loading direction as indicated by an arrow in Fig. 8, the first to fourth guide protrusions 10A to 10D formed on the guide wall sections 2C and 2D of the main apparatus 2 are moved in the first to fourth guide recesses 9A to 9D of the battery device 1, respectively. The battery device 1 is retained by the main apparatus 2 by the guide protrusions being caused to bear against the ends of the first to fourth guide recesses 9A to 9D, respectively.

[0081] As the battery device 1 is moved along the loading direction, the loading guide 18 integrally formed in the setting surface section 2B of the main apparatus 2 is inserted into the loading guide recess 15 formed in the loading surface section 1C, so that the loading guide 18 is moved along the loading guide recess 15. The battery device 1 is retained by the main apparatus 2 by the loading guide 18 being caused to bear against the one end of the loading guide recess 15.

[0082] In addition, when the battery device 1 is moved along the loading direction, the loading and holding portion 19 protuberantly formed on the setting surface section 2B of the main apparatus 2 is resiliently flexed within the loading and holding recess 16 formed in the loading surface section 1C of the battery device 1, so that the loading and holding lug 19A is engaged in the loading

and holding recess 16 for retaining the battery device 1 on the main apparatus 2.

[0083] Also, when the battery device 1 is moved along the loading direction, the actuating portion 8 formed on the discrimination protrusion 5 of the main apparatus 2 is caused to bear against one end of the charging discriminating member 7 movably mounted in the mounting recess 6 of the loading surface section 1. Thus, when the battery device 1 is moved along the loading direction, the charging discriminating member 7 is thrust inward by the actuating portion 8.

[0084] When the battery device 1, thus loaded in position on the main apparatus 2, is pulled in an opposite direction to the loading direction, the loading and holding portion 19 is elastically flexed by one end of the loading and holding recess 16 for disengaging the loading and holding lug 19A from the loading and holding recess 16.

[0085] Also, when the battery device 1, thus loaded in position on the main apparatus 2, is pulled in a direction opposite to the loading direction, the engagement lug 17A protuberantly formed as one with the engagement portion 17 of the setting surface section 2B of the main apparatus 2 is engaged in the cut-out groove 7A formed in the charging discriminating member 7 movably mounted within the mounting recess 6 of the loading surface section 1C of the battery device. Thus, when the battery device 1 is pulled in an opposite direction to the loading direction, the charging discrimination member 7 is pulled out by the engagement lug 17A.

[0086] The operation of discriminating the battery device 1 by the main apparatus 2 is explained by referring to Figs. 9 to 12. When the battery device 1 is loaded on the main apparatus 2, the discrimination protrusion 5 is inserted along the discrimination recess 4, as shown in Figs. 9 and 10. By the insertion of the discrimination protrusion 5 into the discrimination groove 4, the main apparatus 2 discriminates the battery device 1 loaded thereon.

[0087] Since the discrimination protrusion 5 is formed on the main apparatus 2 at a position offset with respect to the centerline of the mounting recess 40 of the battery device 1, as shown in Figs. 11 and 12, the main apparatus discriminates the conventional battery device of Figs. 13-15 by the discrimination protrusion 5 being abutted against the loading surface section 51B of the battery device 51.

[0088] In the initial loading stage in which the first and fourth guide protrusions 10A and 10D of the main apparatus 2 are caused to bear against the first and fourth guide grooves 46A and 46D, the conventional battery device 51 is tilted by abutment of the discrimination protrusion 5 against the end surface section. Thus, the main apparatus recognizes the loading of an inappropriate battery device 51 based on the tilt of the battery device 51.

[0089] Figs. 16 to 18 illustrate the operative relationship between a battery device 1 and electronic apparatus in accordance with the invention. In particular, Fig.

16 is a perspective view of a battery device 1 adapted to be inserted in a recess 30. As shown, a discrimination protrusion 5 is provided within the recess 30 in order to prevent insertion of an improper type of battery device.

5 Fig. 17 is a top perspective view of an electronic apparatus in which such a recess 30 is provided. Fig. 18 shows a profile of a battery device 1 disposed in a recess 30, in comparison with a conventional battery device 51 (also shown in profile).

10 [0090] With the above-described loading device 3 for the battery device of the embodiment illustrated, the discrimination groove 4 is formed with an offset with respect to the centerline of the loading surface section 1C of the battery device 1, and the beginning ends of the first and second guide recesses 9A and 9C are located so as to be closer to the abutment surface 1D normal to the loading surface section 1C than the terminal end of the discrimination groove 4, while the discrimination protrusion 5 is formed at a position offset with respect to the centerline of the setting surface section 2B of the main apparatus 2, and the beginning ends of the first and third guide protrusions 10A and 10C are located so as to be closer to the abutment surface 2E than the terminal ends of the discrimination protrusion 5.

25 [0091] Thus, with this loading device 3 for the battery device, the discrimination protrusion 5 is inserted into the discrimination recess 4 in the initial loading position in which the first to fourth guide protrusions 10A to 10D formed on the main apparatus 2 are abutted against the first to fourth guide recesses 9A to 9D formed in the battery device 1.

30 [0092] Thus it is possible with the loading device 3 for the battery device to positively and clearly discriminate the conventional battery device 51 by the discrimination protrusion 5, before completion of the loading of the conventional battery device 51 on the main apparatus 2, thereby enabling rejection of loading of the conventional battery device 51.

35 [0093] In the above-described example of a loading device for the battery device according to the present invention, the main apparatus on which the battery device is loaded is a charger for electrically charging the battery device. However, the main apparatus may also be constituted in the casing of an electronic apparatus, such as a portable video camera device, instead of being the charger.

40 [0094] With the above-described preferred embodiment of the battery device according to the present invention, since the discrimination groove is formed at a position offset relative to the centerline of the loading surface section, and the beginning end of the guide recess is located so as to be closer to the abutment surface than the terminal end of the discrimination groove, and hence the discrimination groove can be positively and clearly discriminated by the main apparatus in the initial loading state in which the guide recess in the battery device is abutted against the main apparatus. It therefore becomes possible to positively prevent mis-

taken loading and consequent destruction of the main apparatus.

[0095] In addition, with the above-described preferred embodiment of loading device for the battery device according to the present invention, the discrimination groove is formed with an offset with respect to the centerline of the loading surface section of the battery device, and the beginning ends of the first and second guide recesses are located so as to be closer to the abutment surface normal to the loading surface section than the terminal ends of the discrimination groove, while the discrimination protrusion is formed at a position offset with respect to the centerline of the setting surface section of the main apparatus, and the beginning ends of the first and third guide protrusions are located so as to be closer to the abutment surface than the terminal ends of the discrimination protrusion. Thus, the battery device can be discriminated clearly and positively by the discrimination protrusion in the initial loading state of the battery device on the main apparatus. Thus, it becomes possible to prohibit loading of the inappropriate battery device and consequent destruction of the main apparatus.

Claims

1. A battery device comprising :

a casing (1A) having a battery housing unit (1B) disposed therein and having a loading surface section (1C) on a lateral outer surface thereof, said loading surface section (1C) being adapted for connection to a setting surface section of a main apparatus, and said battery housing unit in said housing being adapted for receiving at least one battery,

wherein said loading surface section (1C) of the casing has a discrimination groove (4) having an opening end opened in an abutment surface (1D) and extending from said opening end in a direction parallel to the loading direction of the battery device on the main apparatus, said abutment surface (1D) being formed on the loading surface of the casing in a direction at right angles to the loading surface section (1C), and

wherein at least a pair of guide recesses (9A - 9D) are formed in lateral surface sections of the casing extending at right angles to the loading surface section (1C), parallel to the loading direction, at an outer periphery of the casing,

said discrimination groove (4) being located at a position offset relative to the centerline of the loading surface section (1C) and the front end of the guide recesses (9A, 9C), with respect to the loading direction of the battery device on the main apparatus, being closer to said abutment surface (1D) than

the rear end of the discrimination groove.

2. The battery device as claimed in claim 1, wherein the battery housing unit (1B) is formed by a spacing delimited by a continuous inner wall section having an arcuate cross-section for holding plural batteries, each having a substantially columnar cross-section, and said discrimination groove (4) is formed in the loading surface section (1C) in a thickened portion of the inner wall section.
3. The battery device as claimed in claim 1 or 2, wherein the guide recesses (9A - 9D) comprise mounting recesses parallel to each other and a charging discrimination member (7) is movably mounted facing the mounting recess for indicating that the battery is non-charged or charged.
4. The battery device as claimed in any one of claims 1 to 3, wherein the casing (1A) has terminals (12A, 12B) at the respective ends of the lateral surface (1D) provided with the opening end of the discrimination groove (4), said terminals being connected to the battery housed within the battery housing unit.
5. A loading device comprising :

a battery device (1) comprising a casing (1A) having a battery housing unit (1B) therein and having a loading surface section (1C) on an outer surface thereof, said loading surface section (1C) being connectable to a setting surface section (2B) of a main apparatus (2), and said battery housing unit being adapted for housing at least one battery, wherein said loading surface section (1C) of the casing has a discrimination groove (4) having an opening end opened in an abutment surface (1D) and extending from said opening end parallel to the loading direction of the battery device (1) on the main apparatus (2), said abutment surface (1D) being formed on the loading surface of the casing in a direction at right angles to the loading surface section (1C), and
a main apparatus (2) having a casing having in turn a setting surface section (2B) on a lateral outer surface thereof for loading the battery device (1) thereon, said casing also having a rib-shaped discrimination protrusion (5) secured at one end thereof to an abutment surface (2E) formed on the setting surface section (2B) at right angles thereto, said discrimination protrusion (5) being formed integrally with the setting surface section (2B),
said discrimination protrusion (5) on the main apparatus being detachably engagable in said discrimination groove (4) in the battery device,

wherein the battery device (1) has at least a pair of guide recesses (9A - 9D) on its lateral surfaces extending at right angles to the loading surface section (1C) extending parallel to the loading direction, the discrimination groove (4) being offset with respect to the centerline of the loading surface section (1C), and the front end of the guide recesses (9A, 9C), with respect to the loading direction of the battery device on the main apparatus, being closer to the abutment surface (1D) than the rear end of the discrimination groove (4),

wherein the main apparatus (2) has at least one guide wall section (2C, 2D) on each lateral side of the setting surface section (2B) for extending at right angles to the setting surface section, guide protrusions (10A - 10D) being formed on the inner wall section of the guide wall sections (2C, 2D), the discrimination protrusion (5) being integrally formed at an offset position with respect to the centerline of the setting surface section (2B), with the front end of the guide protrusions (10A, 10C), with respect to the loading direction of the battery device on the main apparatus, being closer to the abutment surface (2E) than the rear end of the discrimination protrusion (5), and wherein

in the initial loading state in which the guide protrusions (10A, 10C) provided on the main apparatus (2) are inserted into the guide recesses (9A, 9C) formed in the battery device (1), the discrimination protrusion (5) is inserted into the discrimination groove (4) during loading the battery device in the main apparatus.

6. The loading device as claimed in claim 5, wherein the battery device (1) has a discrimination groove (4) and a mounting recess (9A - 9D) parallel to each other, and a charging discrimination member (7) movably mounted facing the mounting recess for indicating whether the battery is charged or non-charged, and wherein the main apparatus (2) has an actuating portion (8) at the proximal end of the discrimination protrusion (5) for moving inwardly the charging discrimination member (7) provided on the battery device (1).

7. The loading device as claimed in claim 6, wherein the charging discrimination member (7) has a cut-out groove (7A) facing the setting surface section (2B) of the main apparatus (2), the main apparatus including an engagement protrusion engagable in the cut-out groove (7A) formed in the charging discrimination member in alignment with the actuating portion, and wherein the engagement protrusion is engaged in the cut-out groove (7A) when the loading surface section (1C) of the battery device (1) is detached from the setting surface section (2B) of the main apparatus (2) for extracting and shifting

the charging discrimination member (7).

Patentansprüche

1. Batterieanordnung, die umfasst:

ein Gehäuse (1A), das eine Batteriegehäuseeinheit (1B) hat, das darin angeordnet ist und einen Ladeoberflächenabschnitt (1C) auf einer seitlichen äußeren Oberfläche desselben hat, wobei der Ladeoberflächenabschnitt (1C) zur Verbindung mit einem Aufsetzoberflächenabschnitt einer Hauptvorrichtung bestimmt ist und die Batteriegehäuseeinheit in dem Gehäuse zum Aufnehmen zumindest einer Batterie bestimmt ist,

wobei der Ladeoberflächenabschnitt (1C) des Gehäuses eine Unterscheidungsnut (4) hat, die ein Öffnungsende aufweist, das sich in einer Widerlageroberfläche (1D) öffnet, und sich von dem Öffnungsende in einer Richtung parallel zu der Laderichtung der Batterieanordnung auf der Hauptvorrichtung erstreckt, welche Widerlageroberfläche (1D) auf der Ladeoberfläche des Gehäuses in einer Richtung unter rechten Winkeln zu dem Ladeoberflächenabschnitt (1C) ausgebildet ist, und

wobei zumindest ein Paar von Führungsausnehmungen (9A - 9D) in seitlichen Oberflächenabschnitten des Gehäuses ausgebildet ist, die sich unter rechten Winkeln zu dem Ladeoberflächenabschnitt (1C) parallel zu der Laderichtung bei einem äußeren Umfang des Gehäuses erstrecken,

wobei sich die Unterscheidungsnut (4) in einer Position befindet, die relativ zu der Mittellinie des Ladeoberflächenabschnitts (1C) versetzt ist, und das vordere Ende der Führungsausnehmungen (9A, 9C) in bezug auf die Laderichtung der Batterieanordnung auf der Hauptvorrichtung näher als das hintere Ende der Unterscheidungsnut an der Widerlageroberfläche (1D) liegt.

2. Batterieanordnung nach Anspruch 1, in der die Batteriegehäuseeinheit (1B) durch einen Zwischenraum gebildet ist, der durch einen ununterbrochenen Innenwandungsabschnitt abgegrenzt ist, der einen bogenförmigen Querschnitt zum Halten einer Vielzahl von Batterien hat, wovon jede einen im wesentlichen säulenförmigen Querschnitt hat, und die Unterscheidungsnut (4) in dem Ladeoberflächenabschnitt (1C) in einem verdickten Teil des Innenwandungsabschnitts ausgebildet ist.

3. Batterieanordnung nach Anspruch 1 oder 2, in der die Führungsausnehmungen (9A - 9D) Montageausnehmungen umfassen, die einander parallel sind, und ein Ladeunterscheidungsteil (7) beweg-

bar montiert ist, das dem Ladeunterscheidungsteil zum Anzeigen, dass die Batterie nicht geladen oder geladen ist, gegenübersteht.

4. Batterieanordnung nach einem der Ansprüche 1 bis 3, in der das Gehäuse (1A) Anschlusssteile (12A, 12B) an den jeweiligen Enden der seitlichen Oberfläche (1D) hat, die mit dem Öffnungsende der Unterscheidungsnut (4) versehen ist, wobei die Anschlusssteile die Batteriegehäuseeinheit sind.
5. Ladevorrichtung, die eine Batterieanordnung (1) umfasst, die umfasst:

ein Gehäuse (1A), das in sich eine Batteriegehäuseeinheit (1B) hat und einen Ladeoberflächenabschnitt (1C) auf einer äußeren Oberfläche desselben aufweist, wobei der Ladeoberflächenabschnitt (1C) mit einem Aufsetzoberflächenabschnitt (2B) einer Hauptvorrichtung (2) verbindbar ist und die Batteriegehäuseeinheit zum Aufnehmen zumindest einer Batterie bestimmt ist, wobei der Ladeoberflächenabschnitt (1C) des Gehäuses eine Unterscheidungsnut (4) hat, die ein Öffnungsende hat, das sich in einer Widerlageroberfläche (1D) öffnet, und die sich von dem Öffnungsende parallel zu der Laderichtung der Batterieanordnung (1) auf der Hauptvorrichtung (2) erstreckt, welche Widerlageroberfläche (1D) auf der Ladeoberfläche des Gehäuses in einer Richtung unter rechten Winkeln zu dem Ladeoberflächenabschnitt (1C) ausgebildet ist, und eine Hauptvorrichtung (2), die ein Gehäuse hat, das wiederum einen Aufsetzoberflächenabschnitt (2B) auf einer seitlichen äußeren Oberfläche desselben zum Laden der Batterieanordnung (1) darauf hat, wobei das Gehäuse außerdem einen rippenförmigen Unterscheidungsvorsprung (5) hat, der an einem Ende desselben an einer Widerlageroberfläche (2E) befestigt ist, die auf dem Aufsetzoberflächenabschnitt (2B) unter rechten Winkeln dazu ausgebildet ist, welcher Unterscheidungsvorsprung (5) integral mit dem Aufsetzoberflächenabschnitt (2B) ausgebildet ist,

wobei der Unterscheidungsvorsprung (5) auf der Hauptvorrichtung abnehmbar in die Unterscheidungsnut (4) in der Batterieanordnung eingreifen kann,

wobei die Batterieanordnung (1) zumindest ein Paar von Führungsausnehmungen (9A - 9D) in ihren seitlichen Oberflächen hat, die sich unter rechten Winkeln zu dem Ladeoberflächenabschnitt (1C) erstrecken, der sich parallel zu der Laderichtung erstreckt, wobei die Unterscheidungsnut (4) in bezug auf die Mittellinie des Ladeoberflächenab-

schnitts (1C) versetzt ist und sich das vordere Ende der Führungsausnehmungen (9A, 9C) in bezug auf die Laderichtung der Batterieanordnung auf der Hauptvorrichtung näher als das hintere Ende der Unterscheidungsnut (4) an der Widerlageroberfläche (1D) befindet,

wobei die Hauptvorrichtung (2) zumindest einen Führungswandungsabschnitt (2C, 2D) auf jeder Seite des Aufsetzoberflächenabschnitts (2B) zum Erstrecken unter rechten Winkeln zu dem Aufsetzoberflächenabschnitt hat, Führungsvorsprünge (10A - 10D) auf dem Innenwandungsabschnitt der Führungswandungsabschnitte (2C, 2D) ausgebildet sind, der Unterscheidungsvorsprung (5) integral in einer versetzten Position in bezug auf die Mittellinie des Aufsetzoberflächenabschnitts (2B) ausgebildet ist, wobei sich das vordere Ende der Führungsvorsprünge (10A, 10C) in bezug auf die Laderichtung der Batterieanordnung auf der Hauptvorrichtung näher als das hintere Ende des Unterscheidungsvorsprungs (5) an der Widerlageroberfläche (2E) befindet, und

wobei in dem anfänglichen Ladezustand, in dem die Führungsvorsprünge (10A, 10C), die auf der Hauptvorrichtung (2) vorgesehen sind, in die Führungsausnehmungen (9A, 9C) eingeführt werden, die in der Batterieanordnung (1) ausgebildet sind, der Unterscheidungsvorsprung (5) während des Ladens der Batterieanordnung in die Hauptvorrichtung in die Unterscheidungsnut (4) eingeführt wird.

6. Ladevorrichtung nach Anspruch 5, in der die Batterieanordnung (1) eine Unterscheidungsnut (4) und einen Ladeunterscheidungsteil (9A - 9D), die einander parallel sind, und ein Ladeunterscheidungsteil (7) hat, das bewegbar montiert ist, wobei es dem Ladeunterscheidungsteil zum Anzeigen, dass die Batterie nicht geladen oder geladen ist, gegenübersteht, und in der die Hauptvorrichtung (2) einen Betätigungsteil (8) an dem körpernahen Ende des Unterscheidungsvorsprungs (5) zum Einwärtsbewegen des Ladeunterscheidungsteils (7) hat, der auf der Batterieanordnung (1) vorgesehen ist.
7. Ladevorrichtung nach Anspruch 6, in der das Ladeunterscheidungsteil (7) eine Nut (7A) hat, die dem Aufsetzoberflächenabschnitt (2B) der Hauptvorrichtung (2) gegenüberliegt, die Hauptvorrichtung einen Eingreifvorsprung enthält, der in die Nut (7A) eingreifen kann, die in dem Ladeunterscheidungsteil in Ausrichtung mit dem Betätigungsteil ausgebildet ist, und in der der Eingreifvorsprung, wenn der Ladeoberflächenabschnitt (1C) der Batterieanordnung (1) von dem Aufsetzoberflächenabschnitt (2B) der Hauptvorrichtung (2) abgenommen ist, zum Herausziehen und Verschieben des Ladeun-

terscheidungsteils (7) in die Nut (7A) eingreift.

Revendications

1. Dispositif de batterie, comprenant :

un carter (1A) ayant une unité (1B) de logement de batterie formée à l'intérieur et ayant une section de surface de chargement (1C) à une surface latérale externe, la section de surface de chargement (1C) étant destinée à être raccordée à une section de surface de positionnement d'un appareil principal, et l'unité de logement de batterie placée dans le boîtier étant destinée à loger au moins un accumulateur,

dans lequel la section de surface de chargement (1C) du carter a une gorge de discrimination (4) ayant une extrémité d'ouverture qui débouche dans une surface de butée (1D) et qui s'étend depuis l'extrémité d'ouverture en direction parallèle à la direction de chargement du dispositif de batterie sur l'appareil principal, la surface de butée (1D) étant formée sur la surface de chargement du carter en direction perpendiculaire à la section de surface de chargement (1C), et

dans lequel une paire au moins de cavités de guidage (9A-9D) est formée sur les sections de surface latérale du carter qui sont perpendiculaires à la section de surface de chargement (1C), parallèlement à la direction de chargement, à une périphérie externe du carter,

la gorge de discrimination (4) se trouvant en position décalée par rapport à l'axe central de la section de surface de chargement (1C), et l'extrémité avant des cavités de guidage (9A, 9C), par rapport à la direction de chargement du dispositif de batterie de l'appareil principal, étant plus proche de la surface de butée (1D) que l'extrémité arrière de la gorge de discrimination.

2. Dispositif de batterie selon la revendication 1, dans lequel l'unité (1B) de logement de batterie est formée par un espace délimité par une section de paroi interne continue ayant une section courbe et destinée à contenir plusieurs accumulateurs ayant chacun une section pratiquement en forme de colonne, et la gorge de discrimination (4) est formée dans la section de surface de chargement (1C) d'une partie épaissie de la section de paroi interne.

3. Dispositif de batterie selon la revendication 1 ou 2, dans lequel les cavités de guidage (9A-9D) comportent des cavités de montage parallèles mutuellement et un organe de discrimination de charge (7) est monté afin qu'il soit mobile en face de la cavité de montage pour indiquer si la batterie est chargée

ou non.

4. Dispositif de batterie selon l'une quelconque des revendications 1 à 3, dans lequel le carter (1A) a des bornes (12A, 12B) aux extrémités respectives de la surface latérale (1D) ayant l'extrémité d'ouverture de la gorge de discrimination (4), les bornes étant connectées à l'accumulateur logé dans l'unité de logement de batterie.

5. Dispositif de chargement comprenant :

un dispositif de batterie (1) qui comprend un carter (1A) ayant une unité (1B) de logement de batterie à l'intérieur et ayant une section de surface de chargement (1C) à une surface externe, la section de surface de chargement (1C) pouvant être raccordée à une section de surface de positionnement (2B) d'un appareil principal (2), et l'unité de logement de batterie étant destinée à loger au moins un accumulateur, dans lequel la section de surface de chargement (1C) du carter a une gorge de discrimination (4) ayant une extrémité d'ouverture qui débouche à une surface de butée (1D) et s'étend depuis l'extrémité de l'ouverture parallèlement à la direction de chargement du dispositif de batterie (1) sur l'appareil principal (2), la surface de butée (1D) étant formée sur la surface de chargement du carter en direction perpendiculaire à la section de surface de chargement (1C), et

un appareil principal (2) ayant un carter qui a lui-même une section de surface de positionnement (2B) à une surface latérale externe pour le chargement du dispositif de batterie (1) sur cette surface, le carter ayant aussi une saillie (5) de discrimination en forme de nervure fixée à une première extrémité à une surface de butée (2E) formée sur la section de surface de positionnement (2B) en direction perpendiculaire à celle-ci, la saillie de discrimination (5) étant formée afin qu'elle soit solidaire de la section de surface de positionnement (2B), la saillie de discrimination (5) placée sur l'appareil principal pouvant coopérer de façon amovible avec la gorge de discrimination (4) formée dans le dispositif de batterie,

dans lequel le dispositif de batterie (1) possède au moins une paire de cavités de guidage (9A-9D) sur ces surfaces latérales qui sont perpendiculaires à la section de surface de chargement (1C), s'étendant parallèlement à la direction de chargement, la gorge de discrimination (4) étant décalée par rapport à l'axe central de la section de surface de chargement (1C), et l'extrémité avant des cavités de guidage (9A, 9C), par rapport à la direction

de chargement du dispositif de batterie sur l'appareil principal, étant plus proche de la surface de butée (1D) que l'extrémité arrière de la gorge de discrimination (4),

dans lequel l'appareil principal (2) possède au moins une section de paroi de guidage (2C, 2D) sur chaque côté latéral de la section de surface de positionnement (2B) afin qu'elle s'étende perpendiculairement à la section de surface de positionnement, des saillies de guidage (10A-10D) étant formées sur la section de paroi interne parmi les sections de paroi de guidage (2C, 2D), la saillie de discrimination (5) étant formée solidairement à une position décalée par rapport à l'axe central de la section de surface de positionnement (2B), l'extrémité avant des saillies de guidage (10A, 10B) par rapport à la direction de chargement du dispositif de batterie sur l'appareil principal étant plus proche de la surface de butée (2E) que l'extrémité arrière de la saillie de discrimination (5), et

dans lequel, à l'état de chargement initial dans lequel les saillies de guidage (10A-10C) placées sur l'appareil principal (2) sont insérées dans les cavités de guidage (9A, 9C) formées dans le dispositif de batterie (1), la saillie de discrimination (5) est insérée dans la gorge de discrimination (4) pendant le chargement du dispositif de batterie sur l'appareil principal.

6. Dispositif de chargement selon la revendication 5, dans lequel :

le dispositif de batterie (1) possède une gorge de discrimination (4) et une cavité de montage (9A-9D) parallèles mutuellement, et un organe de discrimination de charge (7) monté afin qu'il soit mobile en face de la cavité de montage pour indiquer si la batterie est chargée ou non, et dans lequel l'appareil principal (2) possède une partie de manoeuvre (8) à l'extrémité interne de la saillie de discrimination (5) afin qu'elle déplace vers l'intérieur l'organe de discrimination de charge (7) placé sur le dispositif de batterie (1).

7. Dispositif de chargement selon la revendication 6, dans lequel l'organe de discrimination de charge (7) a une gorge découpée (7A) tournée vers la section de surface de positionnement (2B) de l'appareil principal (2), l'appareil principal ayant une saillie de coopération destinée à coopérer avec la gorge découpée (7A) formée dans l'organe de discrimination de charge dans l'alignement de la partie de manoeuvre, et dans lequel la saillie de coopération est en prise avec la gorge découpée (7A) lorsque la section de surface de chargement (1C) du dispositif de batterie (1) est séparée de la section de surface de positionnement (2B) de l'appareil principal (2)

pour l'extraction et le déplacement de l'organe de discrimination de charge (7).

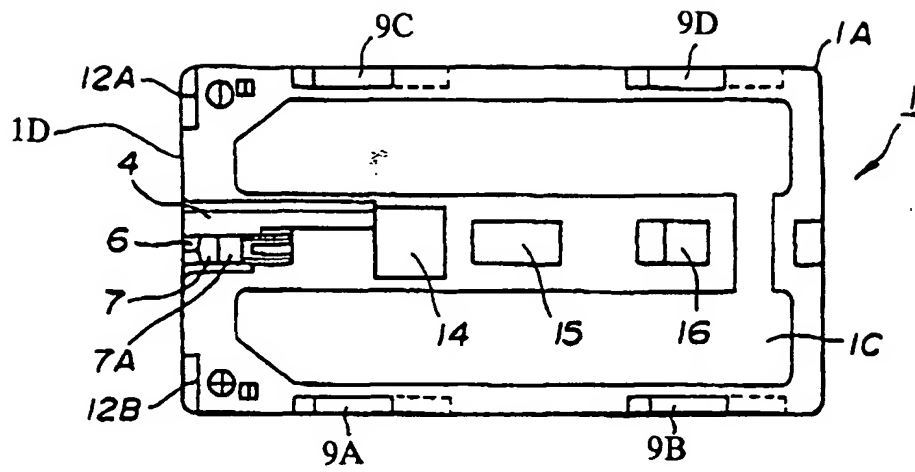


FIG.1

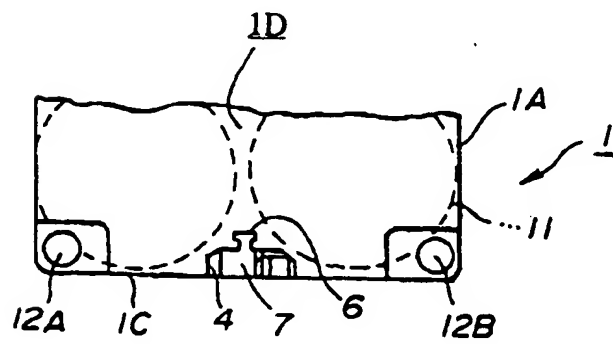


FIG.2

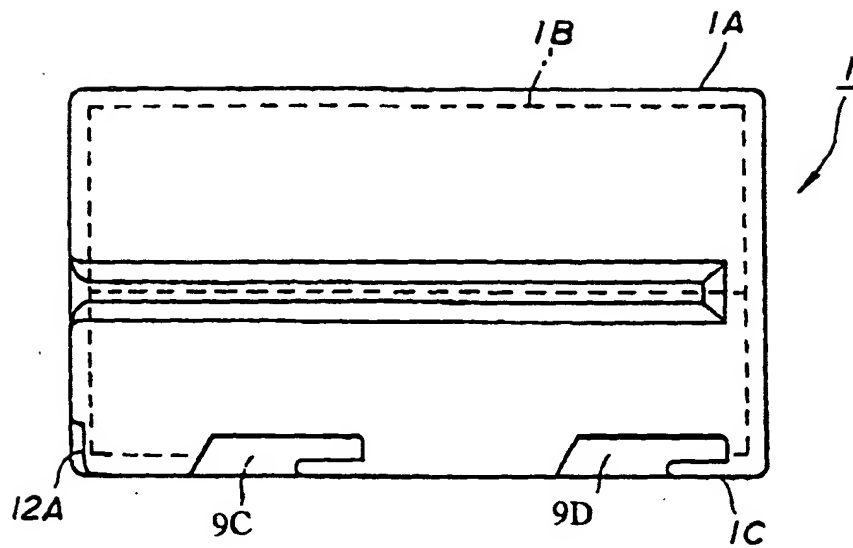


FIG.3

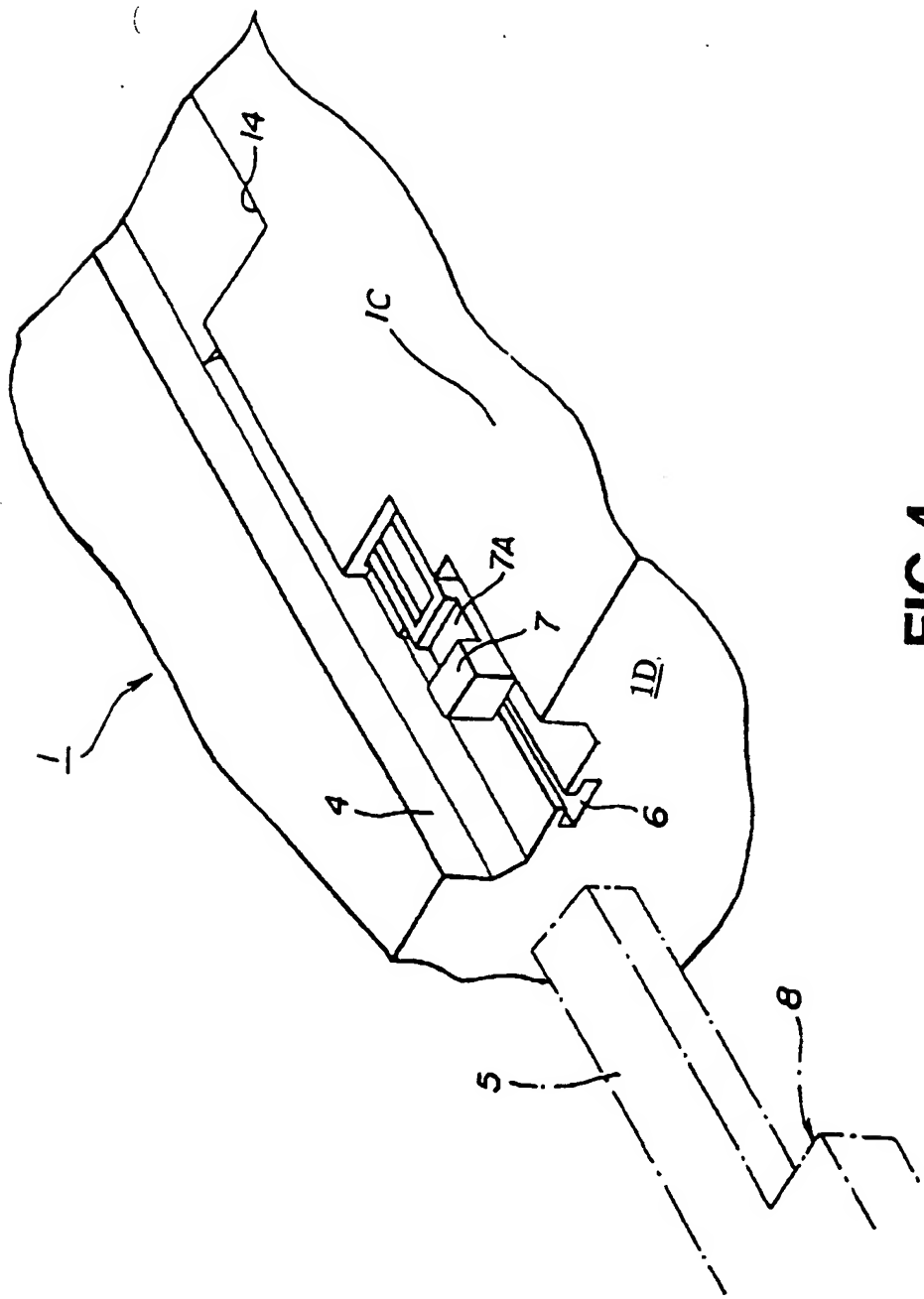


FIG. 4

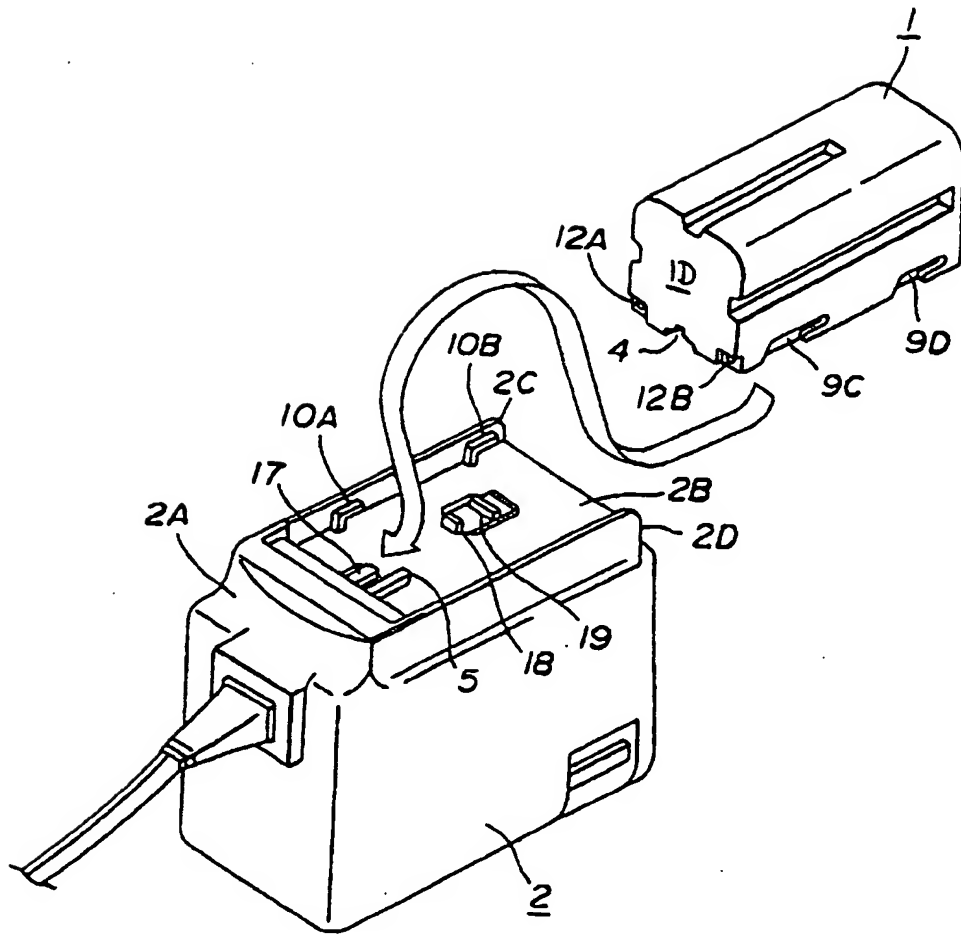


FIG.5

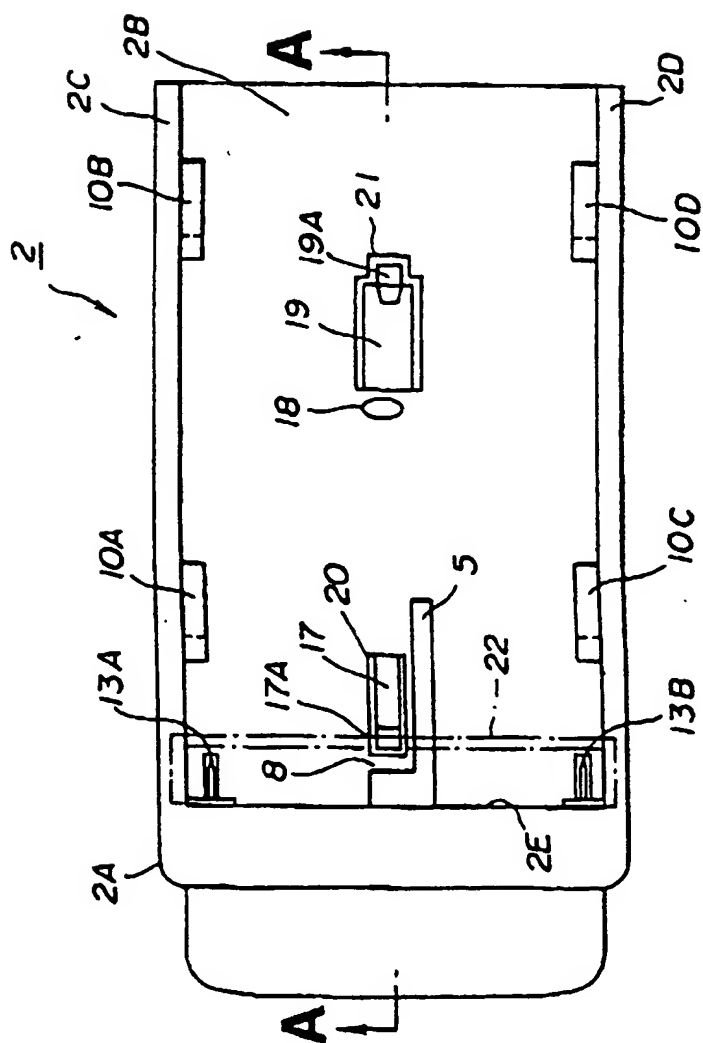


FIG. 6

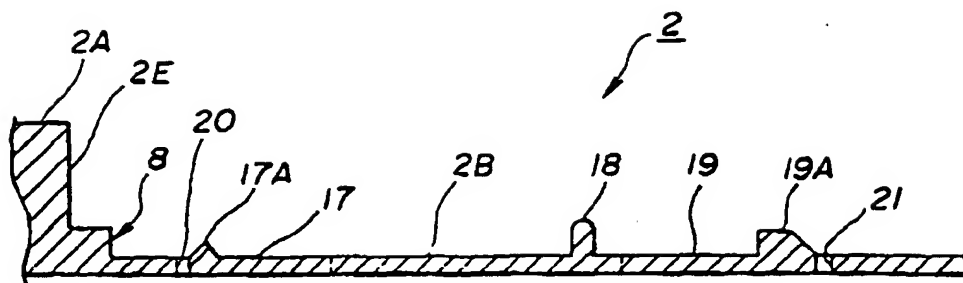


FIG. 7

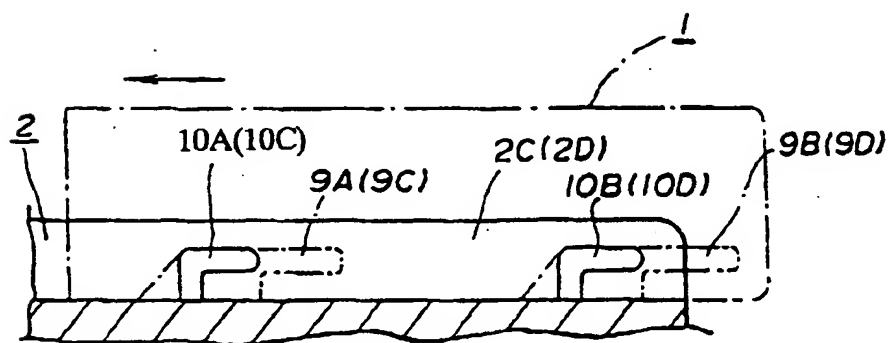


FIG. 8

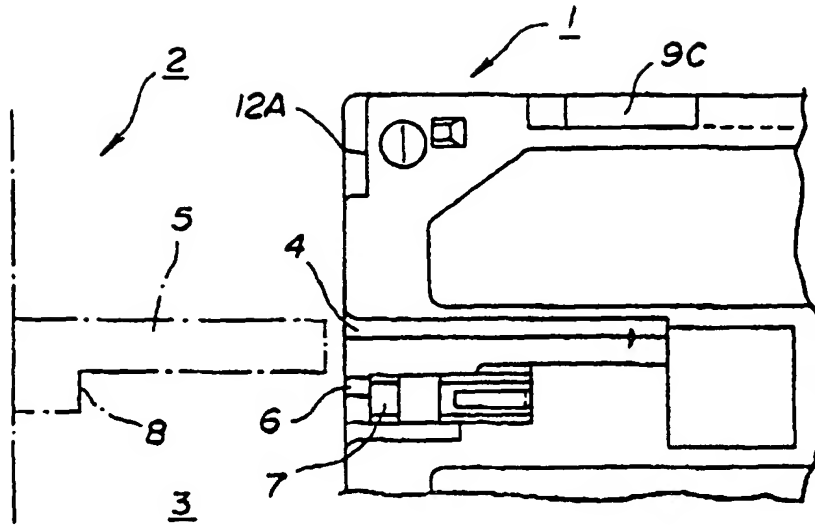


FIG.9

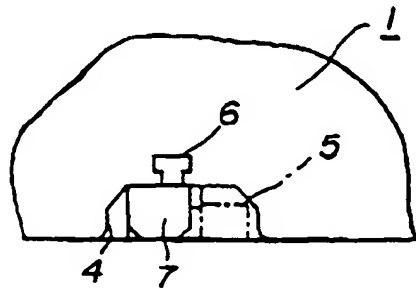


FIG.10

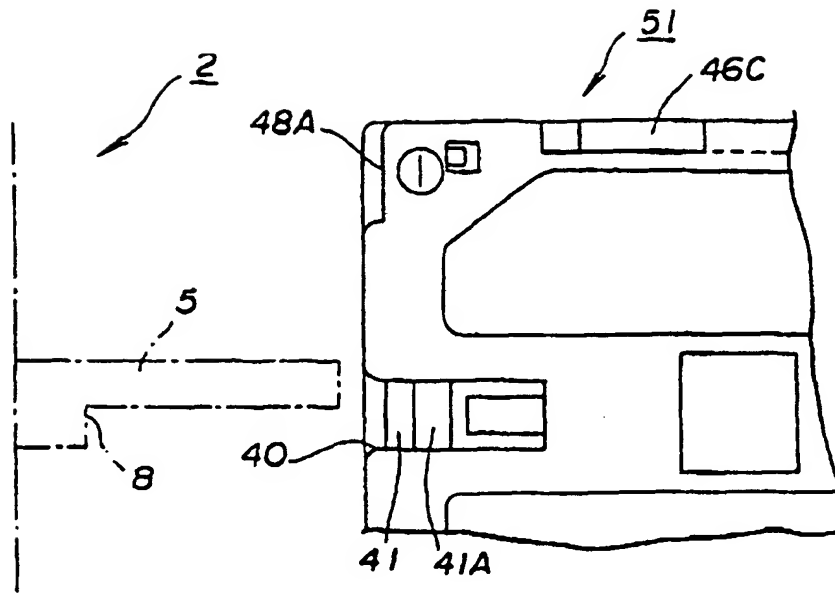


FIG.11

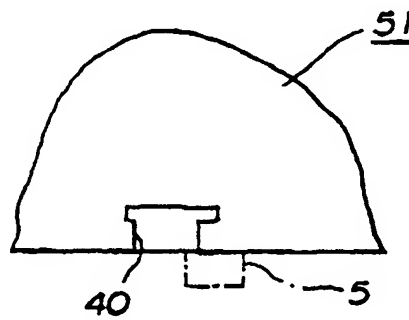


FIG.12

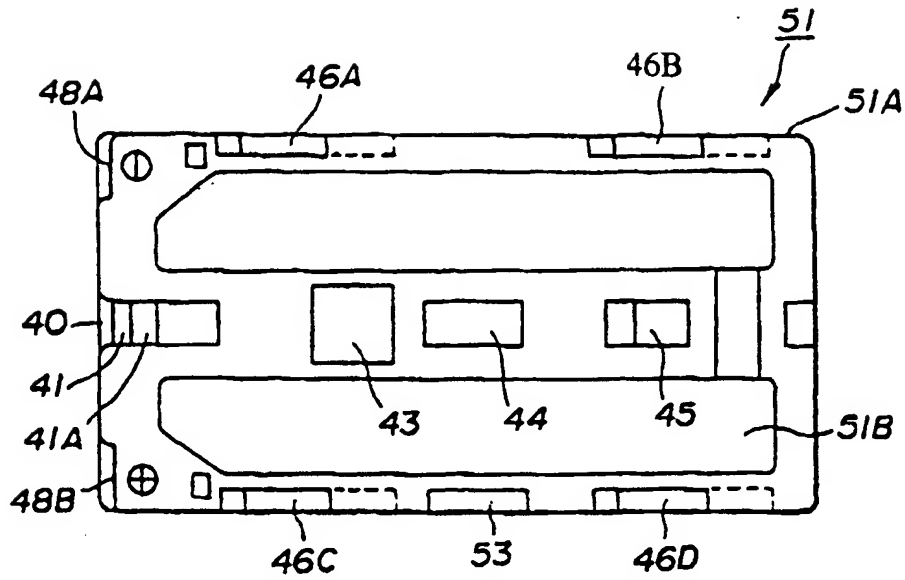


FIG. 13

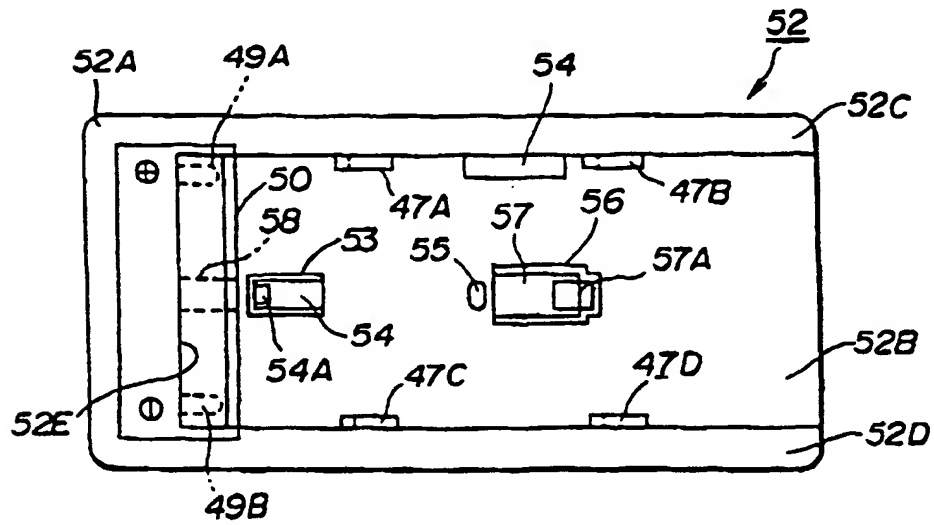


FIG. 14

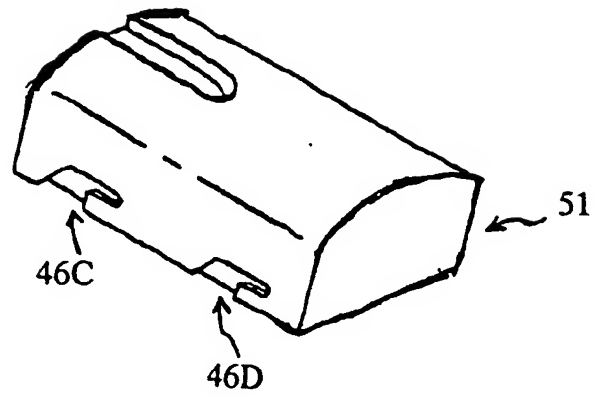


FIG. 15

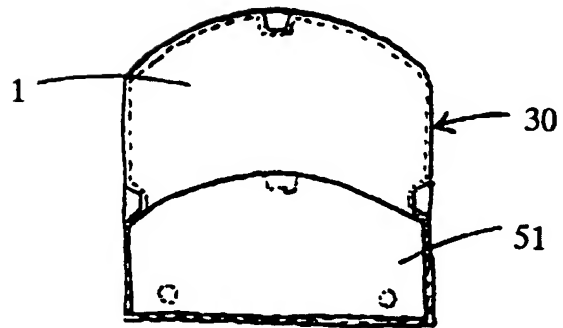


FIG. 18

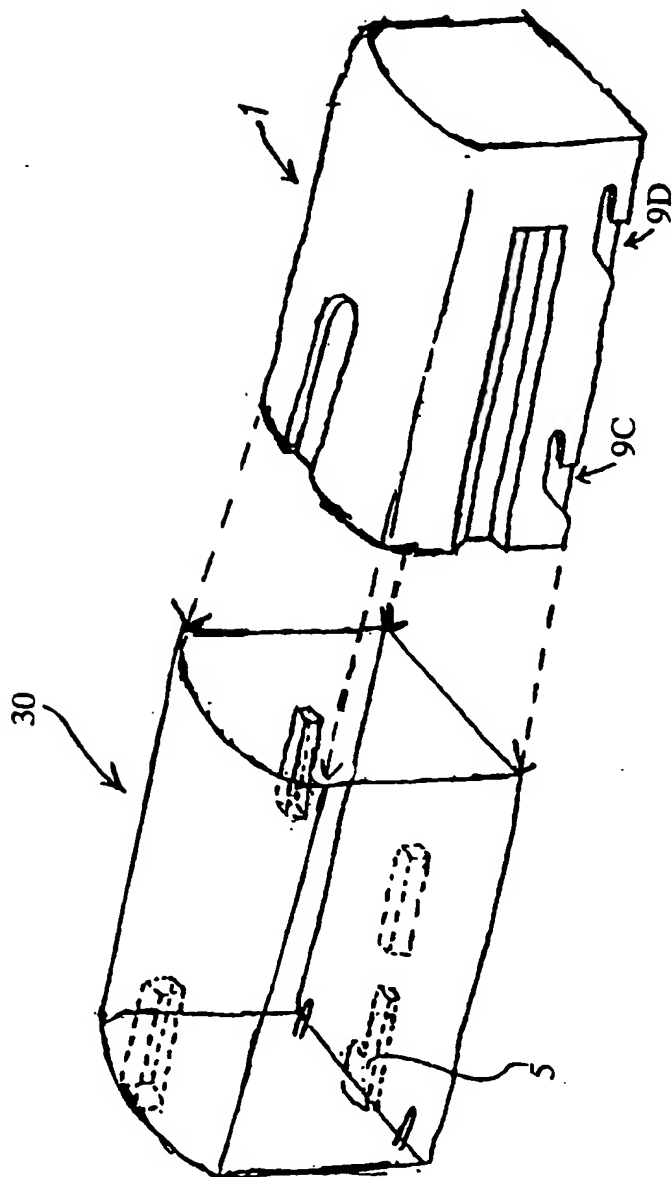


FIG. 16

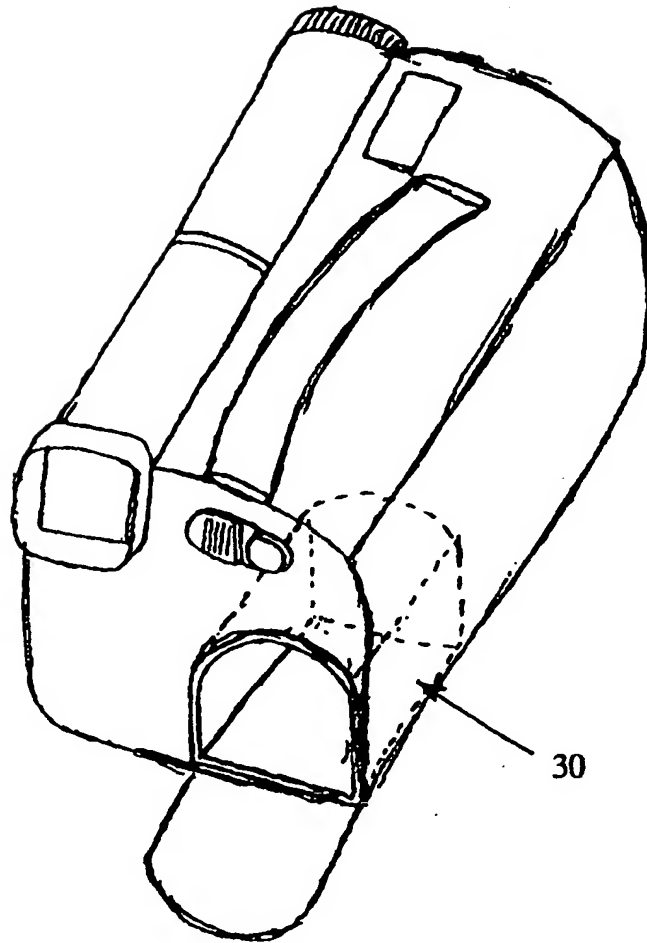


FIG.17